

NOTE: Perform calculations for LRFD method ONLY.

- I. Complete the following problems from the textbook:
Chapter 5 – Compression Members:
5-3
5-5
5-9
5-12
5-18
- II. Also, answer the following problems:
1. A $W18 \times 119$ is used as a compression member with one end fixed and the other end pinned. The length is 12 feet. What is the available compressive strength if A992 steel is used?
 - a. Use AISC Equation E3-2 or E3-3. Compute both the design strength for LRFD
 - b. Use Table 4-22 from Part 4 of the *Manual*. Compute both the design strength for LRFD
 2. A 20-foot long column is pinned at the bottom and fixed against rotation but free to translate at the top. It must support a service dead load of 110 kips and a service live load of 110 kips. Select a W12 of A992 steel. Use the column load tables.
 3. An HSS $10 \times 6 \times 5/16$ with $F_y = 46$ ksi is used as a column. The length is 15 feet. Both ends are pinned, and there is support against weak axis buckling at a point 6 feet from the top. Determine the design strength for LRFD.

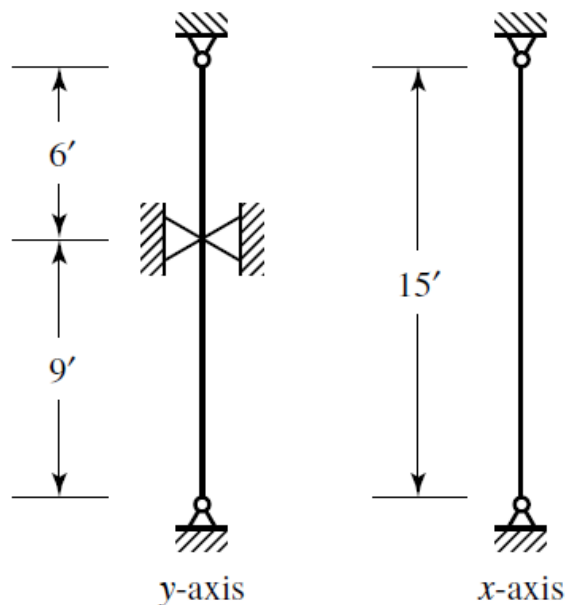


Figure 1

4. Use A992 steel and select a W shape. Use LRFD.

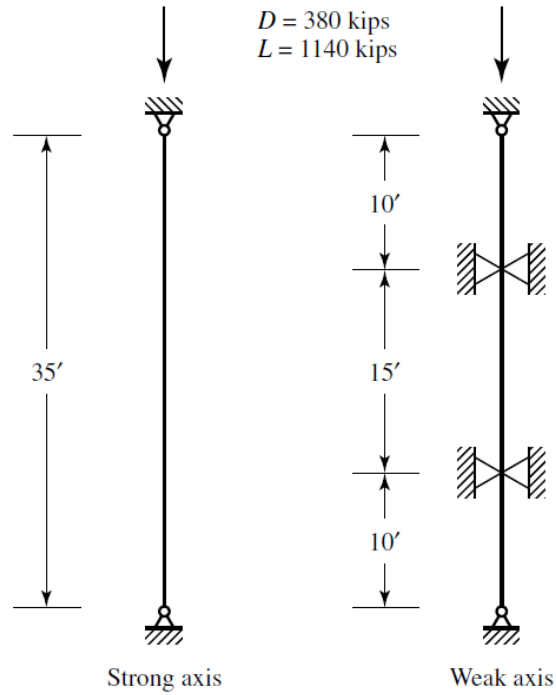


Figure 2

5. A column for a multistory building is fabricated from ASTM A588 plates as shown in Figure 3. Compute the nominal axial compressive strength based on flexural buckling (do not consider torsional buckling). Assume that the components of the cross section are connected in such a way that the section is fully effective.

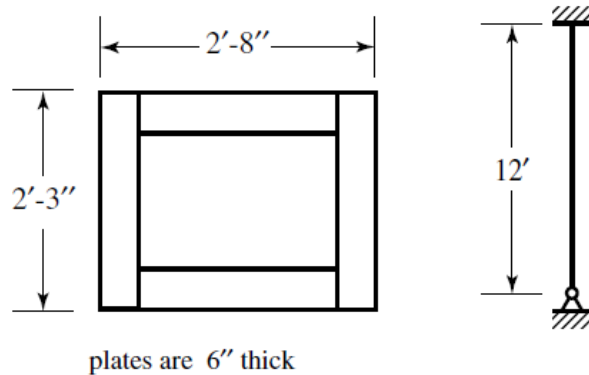


Figure 3